REMARKS

Applicants respectfully requests reconsideration of the application.

Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,889,868 to Moskowitz et al. ("Moskowitz").

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moskowitz.

Claim 1

Claim 1 stands rejected as anticipated by Moskowitz. A review of the Office's citations of passages in Moskowitz reveals that the Examiner is relying on Moskowitz's use of pre-filtering in inserting a digital watermark in a signal. In contrast, claim 1 refers explicitly to watermark detection. Moskowitz is attempting to optimize the insertion of the watermark to maximize encoding levels while minimizing perceivable artifacts. See col. 7, lines 3-6. In contrast, the claimed filter "removes aspects of the host data that are not carrying watermark data, thereby enhancing the signal to noise ratios of the watermark signal." In addition to not pertaining to watermark detection, the cited watermark insertion process in Moskowitz does not remove aspects of the host data that are not carrying watermark data as claimed because this defeats the objective of the insertion process to minimize any perceivable artifacts.

Regardless of the propriety of the rejection, claim 1 has priority to at least May 16, 1996, the filing date of U.S. Patent 5,862,260 to which priority is claimed. Therefore, Moskowitz is not prior art to claim 1.

The priority claim is proper because each application in the chain of priority (09/503,881 (now Patent 6,614,914), 09/186,962 (pending), and 08/649,419 (now Patent 5,862,260)), has at least one common inventor (Geoff Rhoads), satisfies the co-pendency requirement with its immediate parent, and has support in its specification for the claim.

Here's an example of support for claim 1 in the 09/186,962 and 08/649,419 applications:

> Common spatial filtering can then be applied to the fourier transformed suspect image, where the spatial filter to be used would pass all spatial frequencies which are on the crests of the concentric circles and block all other spatial frequencies. The resulting filtered image would be fourier transformed out of the spatial frequency domain back into the image space domain, and almost by visual inspection the inversion or non-inversion of the luminous rings could be detected,

along with identification of the MSB or LSB ring, and the (in this case 8) N-bit identification code word could be found. See Col. 45, lines 27-36 of U.S. Patent 5,862,260

Other related teachings can be found in the following excerpt of the '260 patent at col. 36, line 42 to col. 37, line 9:

> One principle which did not seem to be explicitly present in the Kassam book and which was developed rudimentarily by the inventor involves the exploitation of the magnitudes of the statistical properties of the known signal being sought relative to the magnitude of the statistical properties of the suspect signal as a whole. In particular, the problematic case seems to be where the embedded signals we are looking for are of much lower level than the noise and corruption present on a difference signal. FIG. 14 attempts to set the stage for the reasoning behind this approach. The top figure 720 contains a generic look at the differences in the histograms between a typical "problematic" difference signal, i.e., a difference signal which has a much higher overall energy than the embedded signals that may or may not be within it. The term "mean-removed" simply means that the means of both the difference signal and the embedded code signal have been removed, a common operation prior to performing a normalized dot product. The lower figure 722 then has a generally similar histogram plot of the derivatives of the two signals, or in the case of an image, the scalar gradients. From pure inspection it can be seen that a simple thresholding operation in the derivative transform domain, with a subsequent conversion back into the signal domain, will go a long way toward removing certain innate biases on the dot product "recognition algorithm" of a few paragraphs back. Thresholding here refers to the idea that if the absolute value of a difference signal derivative value exceeds some threshold, then it is replaced simply by that threshold value. The threshold value can be so chosen to contain most of the histogram of the embedded signal.
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> Another operation which can be of minor assistance in "alleviating" some of the bias effects in the dot product algorithm is the removal of the low order frequencies in the difference signal, i.e., running the difference signal through a high pass filter, where the cutoff frequency for the high pass filter is relatively near the origin (or DC) frequency.

W/GA

The above subject matter dates back to U.S. Application No. 08/436,102, filed May 8, 1995, (Now U.S. Patent No. 5,748,783).

Examples of support for claim 1 are also found in application 09/503,881, filed February 14, 2000 (Now U.S. Patent No. 6,614,914), as shown in the following excerpts from the '914 patent:

> In some cases, it is useful to filter the watermarked signal to remove aspects of the signal that are unlikely to be helpful in recovering the message and/or are likely to interfere with the watermark message. For example, the decoder can filter out portions of the original signal and another watermark signal or signals. In addition, when the original signal is unavailable, the reader can estimate or predict the original signal based on properties of the watermarked signal. The original or predicted version of the original signal can then be used to recover an estimate of the watermark message. One way to use the predicted version to recover the watermark is to remove the predicted version before reading the desired watermark. Similarly, the decoder can predict and remove un-wanted watermarks or watermark components before reading the desired watermark in a signal having two or more watermarks. See Col. 9, lines 18-33, of Patent 6,614,914.

> Fig. 5 is flow diagram illustrating a process of extracting a message from re-oriented image data 500. The reader scans the image samples (e.g., pixels or transform domain coefficients) of the re-oriented image (502), and uses known attributes of the watermark signal to estimate watermark signal values 504. Recall that in one example implementation described above, the embedder adjusted sample values (e.g., frequency coefficients, color values, etc.) up or down to embed a watermark information signal. The reader uses this attribute of the watermark information signal to estimate its value from the target image. Prior to making these estimates, the reader may filter the image to remove portions of the image signal that may interfere with the estimating process. For example, if the watermark signal is expected to reside in low or medium frequency bands, then high frequencies may be filtered out. Col. 13, lines 2-17 of Patent 6,614,914

> First, the detector filters the block in a manner that tends to amplify the orientation signal while suppressing noise, including noise from the host image itself (952). Implemented as a multi-axis LaPlacian filter, the filter highlights edges (e.g., high frequency components of the image) and then suppresses them. The term, "multi-axis," means that the filter includes a series of stages that each operates on particular axis. First, the filter operates on the rows of luminance samples, then operates on the columns, and adds the results. The filter may be applied along other axes as well. Each pass of the filter produces values at discrete levels. The final result is an array of samples, each having one of five values: {-2, -1, 0, 1, 2}. Col. 24, lines 16-29 of Patent 6,614,914.

These are just examples of support in the specifications of the priority applications. More information can be provided. Since the requirements for a domestic claim of priority are met, claim 1 has priority to at least as early as May 16, 1996, and also can stretch to May 8, 1995.

Claims 2-4

Claims 2-4 are patentable over Moskowitz for the same reasons presented for claim 1.

Claim 5

Moskowitz fails to disclose all of the elements of claim 5, and claim 5 has priority to at least as early as May 16, 1996, because the requirements of a domestic claim of priority to application no. 08/649,419 are met.

Claim 6

Moskowitz fails to disclose or teach prefiltering of host data prior to watermark detection comprising first applying a highpass operator to said host data and then applying a nonlinear operator to said data as claimed. The pre-filtering referred to in Moskowitz relates to optimizing watermark insertion, not watermark detection as claimed.

Claims 7-9

Claims 7-9 are patentable for the same reasons as independent claim 5.

Claims 10-12

The Office contends that Moskowitz renders claims 10-12 obvious. However, the Office has not established how Moskowitz teaches the elements of the claims in pre-filtering operations used in watermark detection. Again, while Moskowitz mentions pre-filtering in the context of watermarking, this pre-filtering is done to optimize insertion of the watermark, not to prepare a watermarked signal for watermark extraction or detection. Therefore, Moskowitz fails to render these claims obvious.

As an aside, in the priority patent, 5,862,260, Rhoads describes a pre-filtering optimization at col. 90, lines 28-46, that is designed to maximize the embedded signal while

maintaining its imperceptibility in the host signal in which it is embedded. Thus, if the Office still maintains that Moskowitz's approach of pre-filtering used for watermark insertion is relevant and supports the claims, then the priority document would do so as well, providing yet another reason why Moskowitz is not prior art.

Concluding remarks

The cited prior art does not disclose or teach the elements of the claims and/or it is not prior art due to the priority claim. Therefore, the claims are patentable over the cited art. Some of the claims have been amended to correct formal matters not relating to patentability, and the amendments are not made in response to any particular rejection.

Respectfully submitted,

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